S/0203/63/003/006/1021/1035

ACCESSION NR: AP4001825

AUTHOR: Gurevich, A. V.

TITLE: Structure of the disturbed zone in the vicinity of a large charged body in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 3, no. 6, 1963, 1021-1035

TOPIC TAGS: plasma, spherical charged body, Debye radius, electric field intensity, electron distribution, ionosphere, field potential, quasineutrality equation, particle concentration, magnetic field disturbance, absorbing body, reflecting body, ion distribution, electron distribution, charged particle distribution, electric field distribution, infinite rarefied plasma, spaceborne ionospheric sounding, plasma, disturbance, plasma disturbed zone, disturbed zone structure, geomagnetism

ABSTRACT: Flow perturbations around a spherical body in a rarefied unbounded plasma have been studied on the assumption that body radius R_0 is much less than the mean free path but much larger than the Debye radius D. The electric potential $\varphi(r)$ and the ion and electron distributions around the body are calculated for an

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

ACCESSION NR: AP4001825

arbitrary surface potential. The sphere is assumed to have a perfectly absorbing surface. The kinetic equations defining the electron and ion motions, together with Poisson's equations are solved for two conditions. First, $R_0 \gg D$ and consequently

$$\frac{d\varphi^{\circ}}{d\xi} \ll \frac{R_0}{D} \varphi^{\circ},$$

which leads to a quasi-neutral description of the plasma structure. Secondly, conditions very close to the surface are investigated, satisfying the inequality $r - R_0 \sim D \ll R_0$. An analytic solution is given for a strongly positive probe, and numerical results are obtained for an arbitrary probe potential. The ion and electron current flows to the body are determined and the double layer in the probe vicinity discussed. Solutions are presented for a perfectly reflecting surface for comparison purposes. It is shown that structure of the perturbed zone as well as the potential curve differ strongly from the perfectly absorbing case. "The author is grateful to L. V. Pariyskaya for carrying out the numerical computations." Orig. art. has: 43 equations and 9 figures.

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ACCESSION NR: AP4001825

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics AN SSSR)

SUBMITTED: 31Jul63 DATE ACQ: 17Dec63 ENCL: 00

SUB CODE: AS NO REF SOV: 003 OTHER: 005

Card 3/3

S/057/63/033/003/004/021
B104/B180

AUTHORS: Gurevich, A. V., and Zhivlyuk, Yu. N.

TITLE: The heating of multi-charged impurity ions in a plasma

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 33, no. 3, 1963, 276-290

TEXT: The behaviour of multi-charged impurity ions is investigated in a strongly ionized plasma consisting of electrons and singly ionized ions in a constant electric field. It is shown that at sufficiently high electric field intensities the multi-charged ions are not in thermal equilibrium with the other plasma particles. The impurity ions may exist in a peculiar stationary state with a high effective temperature and high velocity of oriented motion. This state arises at electric field intensi' es

$$E > E_{k.1} = \frac{17}{T_e}\left(\frac{M_p}{M_0}\right)^{1/2}\frac{Z}{Z-1}\frac{N}{10^{14}},$$

where T_e is expressed in ev and E in v/cm. The time required for this state to become stationary is $\tau = 6.3\cdot 10^7 MT_e^{3/2}/NZ^2$. For the multi-
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charged ions to reach a high temperature they must undergo considerable scattering on non-uniformities; this is given by L the path length of the dimensionless parameter

$$q = \frac{M}{mZ^2}\frac{v_{T_i}}{L\nu_{i0}} = \frac{M}{M_0 Z^2}\frac{9\cdot 10^{13}}{N}\frac{T_e^{3/2} T_{i0}^{1/2}}{L}.$$

In this state the energy of the impurity ions is from one to three times greater than the mean energy of the electrons and the plasma main ions. M_0 is the mass and T_{io} the temperature of plasma ions, M_p is the proton mass. There are 8 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR, Moskva (Physics Institute imeni P. N. Lebedev AS USSR, Moscow)

SUBMITTED: February 14, 1962

S/056/63/044/004/026/044
B102/B186

AUTHOR: Gurevich, A. V.

TITLE: Smearing out of inhomogeneities in a weakly ionized plasma in a magnetic field (ambipolar diffusion)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 4, 1963, 1302 - 1306

TEXT: The common diffusion in a plasma, ocurring at the rate $v_i(1+T_e/T_i)$, becomes anisotropic when a magnetic field is present. Along the field direction ambipolar diffusion takes place at the rate v_i, transverse to the field at $v_e(1+T_i/T_e)$. On the basis of these laws the distribution functions should be obtainable and should yield a correct inhomogeneity distribution. This is, however, not the case; such a generalization leads to a distorted image of the effect. The present paper is devoted to this phenomenon. An inhomogeneity in a weakly ionized plasma is considered, which is assumed to vary per mean free path and mean free time so little that its motion can be described by the macroscopic theory. The system of the linearized equa-

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tions of motion is solved together with the field equations with the help of a Fourier integral. The results obtained indicate that the initial charge is disassembled and the inhomogeneity with equal ion and electron concentrations is smeared out. This process is known as ambipolar diffusion. It is much more complex than the usual diffusion process and depends on the initial structure of the inhomogeneity, especially on its shape and position with respect to the magnetic field. If its dimensions in the field direction are much smaller than those transverse to it, there is no diffusion anisotropy; if the inhomogeneity is stretched out along the field, anisotropy is highest, and the electron diffusion transverse to the field plays the main role.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute imeni P. N. Lebedev of the Academy of Sciences USSR)

SUBMITTED: November 3, 1962

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

GUREVICH, A.V.; PITAYEVSKIY, L.P.

Nonlinear effects in plasma resonance. Zhur. eksp. i teor. fiz. 45 no.4:1243-1251 O '63. (MIRA 16:11)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR i Institut fizicheskikh problem AN SSSR.

S/053/63/079/001/002/003
B102/B186

AUTHORS: Al'pert, Ya. L., Gurevich, A. V., Pitayevskiy, L. P.

TITLE: Effects caused by artificial satellites flying rapidly through the ionosphere or the interplanetaric medium

PERIODICAL: Uspekhi fizicheskikh nauk, v. 74, no. 1, 1963, 23-80

TEXT: This review article reports on theoretical investigations of the interaction of a moving body with dilute plasma when the body velocity is much greater than the thermal velocities of the neutral particles and ions, and its size is large with respect to the Debye radius. The chapters of the article deal with (1) Introduction (presentation of the problem, fundamental data; the plasma parameters of ionosphere, interplanetary gas and interstellar medium are given); (2) The structure of the disturbed region around the moving body (Initial equations; disturbed concentration of neutral particles; magnetic field effect on the disturbed ion concentration; the electric field around the body); (3) Scattering of radiowaves from the track of the body in the medium (presentation of problem; calculation of the Fourier components of electron density perturbation; determination of the track scattering cross-section;

Effects caused by artificial ... S/053/63/079/001/002/003 B102/B186

the scattered-wave field at the point of observation; the scattering cross-section in the case of zero magnetic field; perturbations caused by a point body); (4) The particle flux near the body (General remarks; the neutral-particle flux near the rapidly moving body); (5) Conclusions. In the conclusions it is pointed out that the effects arising during the passage of satellites or cosmic rockets through any medium that can be considered as a plasma have to be considered when experimental data obtained from such bodies are evaluated. This is particularly important for probe measurements. There are 22 figures, 9 tables, and 39 references.

Card 2/2

GUREVICH, A. V.; PITAYEVSKIY, L. P.

"Resonant ionospheric disturbances near the surface of satellite antennas."

report submitted for 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

L 24499-65 EEC-4/EEC(b)-2/EWP(m)/EWG(v)/EPA(w)-2/EWA(h)/EWG(k)/EWT(1)/EEC(t)/FS(v)-3/EPA(sp)-2/FCC/T/EWA(m)-2/EEC(a)/EEC(j)/EEC(r)/EWA(d) Pd-5/Pg-4/Pi-4/Po-4/Pq-4/Pt-10/Pr-6/Pab-10/Pae-2/Peb IJP(c)/AFMDC/AFWL/AEDC(b)/SSD/SSD(b)/AEDC(a)/ASD(a)-5/AFTC(a)/AFETR/ESD(si)/ESD(gs)/ESD(t) AT/GW/WS

ACCESSION NR AM4040599 BOOK EXPLOITATION S/

B+1

Al'pert, YAkov L'vovich; Gurevich, Aleksandr Viktorovich; Pitayevskiy, Lev Petrovich

Artificial satellites in rarefied plasma (Iskusstvenny*ye sputniki v razrezhennoy plazme), Moscow, Izd-vo "Nauka", 1964, 382 p. illus., biblio. 3,000 copies printed.

TOPIC TAGS: aerospace, artificial satellite, rarefied plasma

PURPOSE AND COVERAGE: The monograph considers various phenomena that appear in the motion of artificial Earth satellites in the ionosphere and interplanetary space. The instance of a rapidly moving body whose speed is considerably greater than the speed of particles in a plasma is studied at greatest length. There is a detailed examination of the problem of diffusion of electromagnetic waves in the "wake" that a satellite forms; a strict theory of sounding is given. The book is intended for researchers, students, and graduate students in radio physics and geophysics.

TABLE OF CONTENTS [abridged]:

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L 24499-65
ACCESSION NR AM4040599

SUB CODE: SV, ME SUBMITTED: 30Jan64 NR REF SOV: 047
OTHER: 022

Card 2/2

ACCESSION NR: AP4034794 S/0293/64/002/002/0232/0245

AUTHOR: Gurevich, A. V.

TITLE: The intensity of an electrical field at the surface of a body in plasma

SOURCE: Kosmicheskiye issledovaniya, v. 2, no. 2, 1964, 232-245

TOPIC TAGS: plasma, electrical field, plasma electric field, charged plasma layer, ionosphere, ion movement

ABSTRACT: The article contains an investigation of the structure of the charged layer at the surface of a body in plasma. The intensity of the electrical field at the surface of the body is determined, and it is shown that field intensity measurements may be employed to determine the directional velocity of ion movement in the ionosphere. In the first part of the article, dealing with a body at rest, the author considers the problem of a body located in plasma, assuming that the dimensions of the body R are far greater than the Debye radius D, as is the case in the ionosphere:

$$R \gg D = \sqrt{kT / 4\pi e^2 N}. \qquad (1)$$

ACCESSION NR: AP4034794

Here k is the Boltzmann factor; T is the temperature; N is the density of charged particles. The body is assumed to be charged, with the plasma polarized at its surface and a space charge layer formed, screening the charge of the body. The author calls this a double layer. It is shown that not only the electron concentration (repelled particles), but also the ion concentration (attracted particles) decreases as the field potential increases in a double layer. The electrical field intensity in a double layer is determined by the following formula:

$$E = \frac{kT}{eD}\frac{d\varphi^*}{d\zeta} = -\sqrt{4\pi N_0 kTZ(\varphi^*)}, \qquad (2)$$

where $Z(\varphi^*)$ is a dimensionless function, determined by a formula given in the text of the article. For purposes of comparison, the author considers a case in which the body completely reflects the particles incident on its surface. The author demonstrates that the behavior of the field and the structure of the double layer in the case of a completely reflective and completely absorptive body differ radically, and he concludes that under real conditions in rarefied plasma a situation always arises which is close to the case of the completely reflective body. In the second part of the article, the author considers a body moving in plasma with a velocity of v_0, on the assumption that this velocity is far less than the thermal velocity of the electrons, that the body is negatively charged, and that

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

ACCESSION NR: AP4034794

the electrons and ions are completely absorbed (neutralized) on impact with the surface of the body. Among the points made by the author in this section of the paper is the fact that the potential at the forward surface of the body is exponentially small, while, conversely, behind the body it is extremely great. The reason for this is the high degree of plasma disturbance behind a rapidly moving body: the plasma is impoverished by the ions which do not succeed in entering the area behind the body near its surface. The electrons, on the other hand, since they are far more mobile than the ions, quickly fill the rarefied region,thereby giving rise to a negative electrical charge. The concluding section of the study is devoted to an estimation of the electrical field intensity on the surface of a body moving in the ionosphere. It is demonstrated that, in order of magnitude, the electrical field intensity E is determined by the product of the characteristic field and a certain constant which depends on the surface potential of the body. Furthermore, the value of the field strength is also a function of the velocity of the body v_0 and the angle α between the velocity of the body and the direction of the normal to the surface of the body at the point in question. The author derives a formula on the basis of which, if the ratio of field intensities at diametrically opposite points of a cylindrical body has been experimentally measured, it is possible to determine $v_0 \cos\alpha / v_T$; that is, in the final analysis, to determine the projection of the velocity with which the body moves with respect to the plasma in the direction orthogonal to the axis of the cylinder. In this connection, if the

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body is at rest or is moving strictly in the direction of its own axis, the magnitude thus measured will show the true velocity of the movement of the ions of the plasma in the direction orthogonal to the cylinder axis. "The author is grateful to V. L. Ginzburg for a number of valuable comments during the discussion of the results of the work, and also to G. L. Gdalevich and I. M. Imyanitov for directing his attention to the problem considered in this article." Orig. art. has: 9 figures and 43 formulas.

ASSOCIATION: None

SUBMITTED: 18Sep63

ATD PRESS: 3079

ENCL: 00

SUB CODE: ME, EM

NO REF SOV: 008

OTHER: 000

Card 4/4

ACCESSION NR: AP4013133 S/0203/64/004/001/0003/0016

AUTHOR: Gurevich, A. V.

TITLE: Structure of the perturbed zone in the vicinity of a small charged body in a plasma

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 1, 1964, 3-16

TOPIC TAGS: plasma, ionized plasma, ion density, electron density, electron collision

ABSTRACT: The influence on a rarified plasma of a positively charged spherical body whose radius R_0 is small compared with the Debye radius is given by $D = (\varkappa T/4\pi e^2 N_0)^{1/2}$. Letting the parameter $\xi = r/R_0$, where r is the distance from the center of the body, and assuming a small potential φ satisfying the condition $\varphi^* = e\varphi/kT \lessgtr 1$ when $r \gtrsim D$, then the potential is given by

$$\varphi^* = \frac{\varphi_0^*}{\xi}\exp\left[-\frac{2^{1/2}R_0}{D}(\xi-1)\right] + \frac{R_0\varphi_\infty^*}{2^{1/2}D\xi}\left\{-\exp\left(-\frac{2^{1/2}R_0}{D}\xi\right)Ei\left(-\frac{2^{1/2}R_0}{D}\xi\right) + \right.$$

$$\left. + \exp\left(\frac{2^{1/2}R_0}{D}\xi\right)\left[Ei\left(\frac{2^{1/2}R_0}{D}\xi\right) - \overline{Ei}\left(\frac{2^{1/2}R_0}{D}\right)\right] + \exp\left[\frac{2^{1/2}R_0}{D}(2-\xi)\right]Ei\left(-\frac{2^{1/2}R_0}{D}\right)\right\},$$

where φ_0 is the potential at the surface of the body. Here $Ei(-x) = -\int_x^\infty \frac{e^{-t}}{t}dt$, $\overline{Ei}(x) = \int_{-\infty}^x \frac{e^t}{t}dt$ and

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$\varphi_\infty^* = \frac{1}{8}\left[4\varphi_0^* - 2\varphi_0^*\Phi(\sqrt{\varphi_0^*}) + \Phi(\sqrt{\varphi_0^*}) - \frac{2\sqrt{\varphi_0^*}}{\sqrt{\pi}}e^{-\varphi_0^*}\right] = \text{const.}$ characterize the behavior of the potential at large distances from the body, where $\Phi(x)$ is the probability integral. When $r < D$, the density of attracted infinite (unbounded) particles (i.e., electrons) is given by

$$N_e(\xi) = N_0\left\{\frac{\sqrt{\varphi_0^*}}{\sqrt{\pi\xi}}(1+\sqrt{1-\xi^{-2}}) + \frac{1}{2}\exp\left(\frac{\varphi_0^*}{\xi}\right)\left[1-\Phi\left(\sqrt{\frac{\varphi_0^*}{\xi}}\right)\right] + \frac{\sqrt{1-\xi^{-2}}}{2}\exp\left(\frac{\varphi_0^*}{\xi+1}\right)\left[1-\Phi\left(\sqrt{\frac{\varphi_0^*}{\xi+1}}\right)\right]\right\}.$$

The density of repelled particles (i.e., ions) near the body, $r \ll D$, is given by

$$N_i(\xi) = \frac{N_0}{2}\exp\left(\frac{-\varphi_0^*}{\xi}\right)\left\{1 + \Phi\left(\sqrt{\frac{\varphi_0^*}{1-\xi^{-1}}}\right) + \sqrt{1-\xi^{-2}}\exp\frac{\varphi_0^*}{\xi(\xi+1)} \times \left[1-\Phi\left(\sqrt{\frac{\varphi_0^*\xi}{\xi+1}}\right)\right]\right\}.$$

The density of finite (bounded) particles is determined by the expression

$N_{efin}(r) = \frac{4\pi}{m^2 r}\int_{E_2}^{E_1} dE \int_{\theta_0}^{\theta} \frac{M f_{fin}(E, M)\,dM}{\sqrt{2mr^2(E+e\varphi) - M^2}}$, where $\theta = \sqrt{2mr^2(E+e\varphi)}$, $\theta_0 = \sqrt{2mR_0^2(E+e\varphi_0)}$, E and M are the energy and angular momentum of the particle, $E_2 = E_{min}(r) = e\frac{R_0^2\varphi_0 - r^2\varphi(r)}{r^2 - R_0^2}$,

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ACCESSION NR: AP4013133

and $E_1 = E_{max}(r) = 0$ in a Coulomb field (or in any field whose potential falls off no faster than $1/r^2$). The form of the distribution function of particles in finite orbits $f_{fin}(E, M)$ depends on the nature of the collisions suffered by the electrons, which in turn depends on the degree of ionization of the plasma. The form of f_{fin} and N_{efin} under a variety of conditions is discussed in considerable detail in an appendix. The flux of unbounded electrons is given by

$$I = I_0\Big\{2\int_{\xi_0}^{\infty} \xi\left\{1 - \exp\left[\varphi^*(\xi) + \frac{\xi}{2}\frac{d\varphi^*}{d\xi}\right]\right\} d\xi + \varphi^*_\infty + \xi_0^2 - (\xi_0^2 - 1)\exp\left[\varphi^*_0(\xi_0) + \frac{\xi_0}{2}\frac{d\varphi}{d\xi_0}\right]\Big\}$$

$(I_0 = (8\pi kT/m)^{1/2} N_0 R_0^2)$, where I_0 is total flux of particles at the surface of the body with no field and ξ_0 is the maximum root of the equation $\varphi^*(\xi_0) - \varphi^*_0 - \frac{\xi_0}{2}(\xi_0^2 - 1)\frac{d\varphi^*}{d\xi_0} = 0$. For large fields $\varphi^* \gg 1$ the densities of unbounded and bounded electrons are $N_{einf} = N_0\sqrt{\frac{\varphi^*}{\pi}}\left(1 + \sqrt{1 - \frac{\varphi_0}{\xi^2\varphi^*}}\right)$ and $N_{efin} = \frac{\varphi_0 R_0^2}{2\pi e r^4}$, respectively. The potential is $\varphi(r) = \varphi_0\frac{R_0^2}{r^2}$. For very small fields $\varphi^*_0 = e\varphi_0/kT \ll 1$ the densities of unbounded electrons and ions are

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$$N_e = \frac{N_0}{2}\left[1+\sqrt{1-\xi^{-2}}-\frac{\varphi_0^*}{\xi^2\sqrt{1-\xi^{-2}}}+\varphi^*\left(1+\frac{1}{\sqrt{1-\xi^{-2}}}\right)\right],$$

$$N_i = \frac{N_0}{2}\left[1+\sqrt{1-\xi^{-2}}+\frac{\varphi_0^*}{\xi^2\sqrt{1-\xi^{-2}}}-\varphi^*\left(1+\frac{1}{\sqrt{1-\xi^{-2}}}\right)\right]$$ respectively. The density of bound electrons in the same approximation is zero. The potential is given by $\varphi^* = \frac{\varphi_0^*}{\xi^2(1+\sqrt{1-\xi^{-2}})}$. The author thanks L. P. Pitayevskiy for valuable discussions. Orig. art. has: 110 equations, 4 diagrams, and 1 table.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics, AN SSSR)

SUBMITTED: 31Jul63 ENCL: 00

SUB CODE: ME NO REF SOV: 006 OTHER: 001

Card 4/4

ACCESSION NR: AP4031628 S/0203/64/004/002/0247/0255

AUTHOR: Gurevich, A. V.

TITLE: Instability of the disturbed zone in the vicinity of a charged body in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 2, 1964, 247-255

TOPIC TAGS: plasma, charged body, thermal velocity, electron, ion

ABSTRACT: The fact of plasma instability at the surface of a body can be established only by detailed quantitative data. The author first determined precise criteria for excitation of instability in plasma under the conditions that the average rate of directed movement of electrons relative to ions is near their thermal velocity. He then analyzes actual conditions for stability at the surface of a body, considering the body is charged to some potential φ_0. He then shows that when Te $>$ Ti and $\varphi_0 \sim 0$ (Te and Ti are temperatures of electrons and ions, respectively) instability relative to longitudinal waves arises. When Te $>$ 1.7, Ti is unstable for the potential range $\varphi_0 \gtrsim 0$. On the other hand, the range of appreciable negative potential $\varphi_0 < -2.5$ kTe/e is stable for any value of the ratio

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ACCESSION NR: AP4031628

Te/Ti. The disturbed zone in the vicinity of very large bodies $Ro \gg c/\omega_0$ (where Ro is the radius of the body and ω_0 is the Langmuir frequency) is unstable relative to transverse electromagnetic waves. This latter means that in the ionosphere, where wavelengths are about 15-20 meters or longer, the indicated instability may arise only at the surface of bodies that have diameters of hundreds of meters or even of kilometers. "The author thanks A. A. Rukhadze for useful discussions." Orig. art. has: 5 figures, 1 table, and 28 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva, AN SSSR (Physical Institute, AN SSSR)

SUBMITTED: 06Nov63

SUB CODE: ME NO REF SOV: 013 ENCL: 00

OTHER: 001

Card 2/2

L 9983-65 EWT(1)/EWG(k)/EPA(sp)-2/EWG(v)/FCC/EEC-4/EPA(w)-2/EEC(t)/T/
EEC(b)-2/EWA(m)-2/EWA(h) Po-4/Pd-5/Pq-4/Pae-2/Peb/Pi-4/Pz-6/Pab-24 IJP(c)/SSD/
RAE(a)/ASD(d)/AFETR/ASD(f)-2/ESD(c)/AEDC(b)/AFWL/ESD(gs)/ESD(t)/ASD(a)-5 AT/GW
ACCESSION NR: AP4046279 WS S/0203/64/004/005/0817/0824

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: The supersonic motion of a body in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 4, no. 5, 1964, 817-824

TOPIC TAGS: plasma, ionosphere, ionospheric charged particle, quasi-neutral plasma, plasma ion concentration

ABSTRACT: As a result of the disturbances in the density of electrons and ions caused by a body moving in plasma, there is a disruption of the quasi-neutral state of the plasma. As a result, an electric field arises which itself influences the distribution of charged particles. Therefore, a rigorous computation of the electron and ion distribution and the distribution of the electric field in the neighborhood of a moving body requires the joint solution of field equations and kinematic equations for the functions of particle distribution. This problem is difficult, but is simplified greatly by taking into account a number of specific circumstances which are usually associated with the motion of bodies (rockets, satellites) in the ionosphere. These circumstances are discussed in detail, with references to the most important papers which have been written on

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ACCESSION NR: AP4046279

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this subject (in particular, A. V. Gurevich, Iskusstvennyye sputniki Zemli, No. 7, Izd-vo AN SSSR, 1961, 101; L. P. Pitayevskiy and V. Z. Kresin, Zh. eksperim. i teor. fiziki, 1961, 40, 271; L. P. Pitayevskiy, Geomagn. i aeronomiya, 1961, 1, No. 1, 194). A simple expression is obtained for the electric field potential. Although in the first approximation the influence of the electric field on the motion of ions can be neglected, it is shown that, strictly speaking, this is true only in the region of concentration in front of the body. A dimensionless equation is derived describing the disturbance of the plasma behind the body. A similarity law is formulated for such motions. The article concludes with a discussion of the problem of electrons and ions which experience finite motion near the body, that is, particles trapped by the electric field in the neighborhood of the body. Orig. art. has: 39 formulas and 1 figure.

ASSOCIATION: Fizicheskiy institut imeni Lebedeva AN SSSR (Lebedev Physics Institute, AN SSSR); Institut fizicheskikh problem AN SSSR (Institute of Physical Problems, AN SSSR)

SUBMITTED: 03May64 ENCL: 00 SUB CODE: ES

NO REF SOV: 013 OTHER: 001

Card 2/2

2

BR

ACCESSION NR: AP4031149 S/0056/64/046/004/1281/1284

AUTHORS: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: Recombination coefficient in a dense low temperature plasma

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1281-1284

TOPIC TAGS: low temperature plasma, recombination coefficient, ionized gas, ionized plasma, energy distribution, momentum distribution, particle collision

ABSTRACT: The electron recombination coefficient is calculated in a multiply charged partially ionized gas for the case when the energy is transferred by electron-electron collisions, and collision with the neutral atoms causes the momentum-direction equilibrium distribution to be established more rapidly than the energy distribution. The recombination coefficient due to triple collisions in the low-temperature plasma ($kT \ll E_i$) is calculated when the recombination

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ACCESSION NR: AP4031149

can be regarded as diffusion by the electron, which executes a finite motion in the ion field, towards negative energies. In such cases the behavior of the captured electrons can be described by a classical transport equation, so that the calculation becomes much simpler. The formula derived for the recombination coefficient is valid for an arbitrary ion charge, particularly for singly-charged ions, and for arbitrary degree ionization of the plasma. The only limitation is that the plasma temperature be low. Comparison with the radiative recombination coefficient and with the recombination coefficient in a weakly ionized plasma shows that even at very low degrees of plasma ionization the recombination due to triple collisions is essentially caused by interaction between electrons and not by the collisions between the electron and the neutral atoms. Orig. art. has: 8 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR); Institut fizicheskikh problem AN SSSR

Card 2/3

ACCESSION NR: AP4031149

(Institute of Physics Problems AN SSSR)

SUBMITTED: 25Jul63 DATE ACQ: 07May64 ENCL: 00

SUB CODE: NP NR REF SOV: 004 OTHER: 002

Card 3/3

GUREVICH, A.V.; SHIIN, V.P.

Acceleration of a plasma under radiation. Izd. fiz. 2 no.2:250-256 Ag '65. (MIRA 18:8)

1. Fizicheskiy institut im. P.N.Lebedova AN SSSR.

L 41802-65 EWT(1)/EPF(n)-2/EWG(v)/EWG(m)/FCC/EEC-4/EPA(w)-2/EEC(t)/EWA(h) Pz-6/Po-4/Pab-10/Pe-5/Pq-4/Pae-2/Peb/Pi-4 IJP(c) WW/AT/GW

ACCESSION NR: AP5005188 S/0203/65/005/001/0070/0080

AUTHOR: Gurevich, A. V.

TITLE: The mechanism of plasma turbulence and cosmic ray acceleration

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 1, 1965, 70-80

TOPIC TAGS: plasma turbulence, cosmic ray, cosmic ray acceleration, gravitational instability, hydrodynamic turbulence, high frequency turbulence

ABSTRACT: In a series of earlier studies (cited in the references), the author has shown that the acceleration of cosmic rays by high-frequency turbulence can greatly exceed the acceleration by hydrodynamic turbulence. The physical factor responsible for this situation is that the high-frequency turbulence corresponds to the minimum possible scale of turbulence in plasma and therefore, during the time of the acceleration, the accelerated particle experiences the maximum number of collisions with waves. In this paper, the author discusses possible mechanisms for the generation of high-frequency turbulence of plasma and changes of phase velocity following from the author's theory of a weakly turbulent plasma (Astron. zh., 41, 992, 1964). The following problems are dis-

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L 41802-65

ACCESSION NR: AP5005188

cussed: 1) mechanism of generation of turbulence by cosmic rays; 2) generation of turbulence by gravitational instability; 3) change in the spectrum of turbulence due to nonlinear effects. It is demonstrated that transverse waves can develop both by synchrotron radiation and by interaction of cosmic ray electrons with plasma waves. With respect to the generation of high-frequency turbulence by sources external to the plasma wave - cosmic ray system, it is clear that only external turbulence can be the energy source of the accelerated particles. The role of gravitational instability is particularly important; it can be responsible for the development of large-scale hydrodynamic turbulence. Powerful fluxes of radiation accompanying explosions can be sources of high-frequency turbulence. Relativistic plasma waves are most effective in accelerating cosmic ray particles. The paper concludes with a discussion of the fate of the generated waves. In the study of problems of cosmic ray acceleration by high-frequency turbulence, it can usually be assumed that the phase velocities of plasma waves are close to the speed of light. "The author wishes to thank S. B. Pikel'ner for his valuable comments". Orig. art. has: 19 formulas and 1 table.

ASSOCIATION: Fizicheskiy institut Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

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L 41802-65

ACCESSION NR: AP5005188

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SUBMITTED: 25May64 ENCL: 00 SUB CODE: AA, ME

NO REF SOV: 006 OTHER: 002

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Card 3/3

L 54982-65 EWT(d)/EWT(l)/EEC(k)-2/EWG(m)/FCC/EWG(v)/EPF(n)-2/EEC-4/EEC(t)/EPA(w)-2/EWA(h) Pn-4/Po-4/Pz-6/Pab-10/Pe-5/Pq-4/Pae-2/Pg-4/Pt-7/Pab/Pi-4/Pl-4 IJP(c) WW/AT/GW/WS-4

ACCESSION NR: AP5010267 UR/0203/65/005/002/0251/0259 550.388.2

AUTHOR: Gurevich, A. V.; Tsedilina, Ye. Ye.

TITLE: The diffusion spread of inhomogeneities in a weakly ionized plasma (ionosphere)

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 2, 1965, 251-259

TOPIC TAGS: plasma physics, ionosphere, ionospheric inhomogeneity, diffusion spread, inhomogeneity diffusion, weakly ionized plasma, radio wave propagation

ABSTRACT: The authors note that the study of the diffusion spread of inhomogeneities (nonuniformities) in plasma within a magnetic field is of definite interest in connection with a number of problems having to do with plasma physics and, in particular, with the physics of the ionosphere. In previous papers, to which the authors refer, significant peculiarities in the character of the spreading process have been noted; however, the effect of the electrical eddy field on this process was not taken into consideration. On the other hand, it is pointed out that the role of this vortical field on the entire inhomogeneity spreading process may be very significant. In the present article, therefore, an effort is made to estimate the effect of the electrical eddy field on the process involved in the diffusion of inhomo- ... netic field. A dispersion equation is ob-

the effect of the electrical eddy field on the process involved in the diffusion of inhomogeneities in weakly ionized plasma within a magnetic field. A dispersion equation is obtained and its roots are determined for a description of the spreading process. It is shown

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L 54982-65

ACCESSION NR: AP5010267

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in the article that within a fairly wide range of typical conditions, diffusion-related spreading of the inhomogeneities is described by an ambipolar diffusion equation of the fourth order. Orig. art. has: 39 formulas and 4 figures.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics, AN SSSR); Institut zemnogo magnetizma, ionosfery i rasprostraneniya radovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation, AN SSSR)

AN SSSR); Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR (Institute of Terrestrial Magnetism, the Ionosphere and Radio Wave Propagation, AN SSSR)

SUBMITTED: 02Jun64 ENCL: 00 SUB CODE: EM, ME

NO REF SOV: 004 OTHER: 002

Card 2/2

L 54983-65 EWT(1)/FCC/EWG(m)/EWG(v)/EPF(n)-2/EEC-4/EPA(w)-2/EEC(t)/EWA(h) Po-4/
Pz-6/Pab-10/Pq-4/Pe-5/Pae-2/Peb/Pi-4 IJP(c) WW/AT/GW
ACCESSION NR: AP5010278 UR/0203/65/005/002/0347/0348
550.385

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B

AUTHOR: Gurevich, A. V.

TITLE: The force acting on a body located in a plasma 21

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 2, 1965, 347-348

TOPIC TAGS: plasma, ion recombination, charged body, ion velocity, ion scattering, charged cylinder 17

ABSTRACT: This short article deals with a qualitative consideration of ion recombination on the surface of a charged body located in a plasma. The basic assumption is that, at a great distance from the surface, the ion is moving in the direction of the internal normal to the surface at a velocity of v_{10}. Because of the effect of the electric field, the velocity of the ion will change as it approaches the surface of the body. An equation is given for ion velocity at the surface. Ion recombination at the surface of the body is then assumed, with a neutral atom forming, colliding with the surface and flying away from it at a given velocity. A formula is derived for the total pulse, imparted by the ion and directed along the internal normal. The problem is then considered under the same conditions, but without recombination, and it is shown that the pulse transmitted by the ions to the body depends essentially on the probability of ion recombination and on the potential of the body

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ACCESSION NR: AP5010278

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surface. Thus, the author shows that the recombination effect has a significant influence on the forces acting on a body located in a plasma. The article further discusses effects in a rarefied plasma connected with the non-uniformity of the body surface or with non-uniformity of the electrical potential on this surface. By way of example, a cylinder located in a rarefield plasma is considered (the length of the free transit of the particles is much greater than the dimensions of the body), on the assumption that the cylinder surface is non-uniform: the ion recombination probability is different at the two ends, but the potential of the entire surface is identical (the author notes that it is possible to achieve the same effect if both ends of the cylinder have identical properties but are electrically insulated with a potential difference created between them). Force equations are derived under these conditions for mirror scattering of the ions on the surface, with the surface of the cylinder not contributing to the deceleration force. "The author thanks L. P. Pitayevskiy for useful advice." Orig. art. has: 4 formulas and 1 figure.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva AN SSSR (Institute of Physics, AN SSSR)

SUBMITTED: 24Aug64 ENCL: 00 SUB CODE: ME, EM

NO REF SOV: 000 OTHER: 002

Card 2/2

L 43741-65 EWT(d)/EWT(l)/EEC(k)-2/EPF(n)-2/EWG(m)/EEC-4/EPA(w)-2 Pi-4/ Pz-6/Po-4/Pab-10/Pg-4/Pt-7/Pi-4/Pl-4 IJP(c) WW/AT

S/0056/65/048/002/0701/0707

ACCESSION NR: AP5006521

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AUTHOR: Gurevich, A. V.

TITLE: Penetration of an electromagnetic wave into a plasma when nonlinearity is taken into account

21

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 2, 1965, 701-707

TOPIC TAGS: radio wave reflection, plasma penetration, radio wave penetration, plasma dielectric constant, electromagnetic wave reflection

4

ABSTRACT: The region of reflection of radio waves propagating in an inhomogeneous plasma is considered, taking account of the effect of the alternating electric field of the wave on the dielectric constant of the plasma. It is shown that as the amplitude of the wave field increases the reflection point shifts into the plasma:

$$\varepsilon(z)=\varepsilon_0(z)+\frac{E_0^2}{E_p^2}\begin{cases} e^{-\sqrt{\delta\delta}z/l}\int\limits_0^{\sqrt{\delta\delta}z/l}\frac{e^{\tau}}{\sqrt{\varepsilon}}d\tau+e^{\sqrt{\delta\delta}z/l}\int\limits_{\sqrt{\delta\delta}z/l}^{\infty}\frac{e^{-\tau}}{\sqrt{\varepsilon}}d\tau, & z>0,\\ e^{\sqrt{\delta\delta}z/l}\int\limits_0^{\infty}\frac{e^{-\tau}}{\sqrt{\varepsilon}}d\tau, & z<0,\end{cases}$$

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ACCESSION NR: AP5006521

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where $\tau = \sqrt{3\delta z/l}$, and $\varepsilon_0(z)$ is the dielectric constant of the plasma, in a linear approximation $\varepsilon_0(z) = 1 - 4\pi e^2 N/m\omega^2$. The magnitude of this shift is calculated:

$$\varepsilon_0(0) = -\frac{E_0^2}{E_p^2}\int_0^\infty \frac{e^{-\tau}}{\sqrt{\tau}}\,d\tau.$$

The change in the critical frequency at which the radio waves pass through the plasma is determined as a function of the amplitude of the wave field:

$$\Delta\omega = 0{,}95\omega_c (E_0/E_p)^{4/3} = 0{,}95(e^2E_0^2/3kTm\delta)^{4/3}\frac{1}{\omega_0^{7/3}}$$

"The author is grateful to V. L. Ginzburg for useful discussion." Orig. art. has: 2 figures, 37 formulas.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva, Akademii nauk SSSR (Physics Institute, Academy of Sciences SSSR)

SUBMITTED: 22Aug64

ENCL: 00

SUB CODE: EC, ME

NO REF SOV: 003

OTHER: 000

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Card 2/2

L 64732-65 EWT(1)/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT

ACCESSION NR: AP5019235 UR/0056/65/049/001/0214/0224

AUTHOR: Gurevich, A. V.; Zhivlyuk, Yu. N.

TITLE: Runaway electrons in a nonequilibrium plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965, 214-224

TOPIC TAGS: nonuniform plasma, plasma interaction, plasma oscillation, electron distribution

ABSTRACT: The kinetic equation for electrons in a plasma situated in a stationary electric field is solved with account taken of the interaction between the electrons and the nonequilibrium oscillations of the plasma. The approach is analogous to that used by one of the authors earlier (Gurevich, ZhETF v. 38, 1597, 1960), but for a variable of the runaway electron flux and under conditions when the angular scatter of the electrons can be large. An important part is played in the analysis by the conditions under which the electron distribution function is spherically symmetrical and by the conditions under which the distribution becomes directional. In the former case it is possible to obtain a solution by expansion in a series of Legendre polynomials, while in the latter it becomes necessary to search for a suitable small parameter for a power-series expansion. Conditions under which one type

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L 64732-65
ACCESSION NR: AP5019235

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of distribution goes over into another are studied. Equations are obtained for the flux of runaway electrons and for the critical field. The results are compared with other published data and it is shown that an elementary analysis, in which the concrete character of the deformation of the electron distribution function in the field is not taken into account, can lead to results that differ even qualitatively from the more exact analysis. Orig. art. has: 2 figures, 47 formulas, and 2 tables.

ASSOCIATION: Komissiya po spektroskopii Akademii nauk SSSR (Commission on Spectroscopy, Academy of Sciences, SSSR) 44,55

SUBMITTED: 13Jan65 ENCL: 00 SUB CODE: ME, NP

NR REF SOV: 010 OTHER: 001

Card 2/2

L 5339-66 EWT(1)/ETC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5021130 UR/0056/65/049/002/0647/0654

AUTHORS: Gurevich, A. V.; Pariyskaya, L. V.; Pitayevskiy, L. P.

TITLE: Self-similar motion of charged plasma

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 647-654

TOPIC TAGS: plasma flow, plasma charged particle, plasma acceleration, plasma temperature

ABSTRACT: A nonlinear kinetic equation is obtained for the description of the self-similar motion of an electron-ion plasma in the absence of collisions. The results are used to determine the expansion of the plasma that occupies a half space and begins to expand into a vacuum at the initial instant of time. The density and the velocity distributions of the ions are obtained. It is shown that during the course of filling the rarefied half space, some of the ions are accelerated by the resulting electric field to velocities of

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ACCESSION NR: AP5021130

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the order of the thermal velocity of the electrons. At the same time, the effective temperature of the ions drops sharply and turns out to be many times smaller than the electron temperature (in the case of identical temperatures in the initial plasma). The results of a numerical calculation are presented. 'The authors are grateful to A. A. Vedenov,44 V. L. Ginzburg,55 L. A. Rudakov,55 A. A. Rukhadze,55 and V. P. Silin 44,55 for discussion.' Orig. art. has: 2 figures and 20 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR); 55 Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physics Problems Academy of Sciences, SSSR) 44,55

SUBMITTED: 10Mar65 ENCL: 00 SUB CODE: ME

NR REF SOV: 008 OTHER: 001

Card 2/2

L 33279-66 EWT(1) IJP(c) AT

ACC NR: AP6011695 SOURCE CODE: UR/0203/66/006/002/0255/0265

AUTHOR: Gurevich, A. V.; Tsedilina, Ye. Ye.

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B

ORG: Physics Institute im. P. N. Lebedev AN SSSR (Fizicheskiy institut AN SSSR); Institute of Terrestrial Magnetism, the Ionosphere, and Radio-wave Propagation, AN SSSR (Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR)

TITLE: Character of dispersion and form of inhomogeneities in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 2, 1966, 255-265

TOPIC TAGS: plasma magnetic field, plasma diffusion, plasma charged particle

ABSTRACT: The authors analyze the character of dispersion in plasma in a magnetic field of inhomogeneities whose dimensions are many times greater than the free path length of the particles. It is shown that in the absence of drift the disturbances of the particle concentration in an inhomogeneity decreases with time in proportion to $1/t^{3/2}$, the same as in ordinary diffusion. The form of the inhomogeneity, however, appreciably differs from ellipsoidal. The asymptotic behavior of the disturbances of the concentration changes qualitatively at large distances: with an increase of r they decrease only by the power law $\delta N\ 1/r^5$ and not by the exponential law $\delta N \sim \exp\{-r^2/rDt\}$ which is characteristic for

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ACC NR: AP6011695

ordinary diffusion. The rate of movement of the inhomogeneity across a magnetic field many times exceeds the rate of transverse diffusion of electrons. It is shown that in the presence of drift of charged particles in the plasma the dispersion of the inhomogeneities no longer bears a diffusion character. A new ("dispersion") mechanism plays an important role of scattering. Disturbances of the concentration decrease in proportion to $1/t^2$, and in one direction in proportion to $1/t^{7/4}$. The form of the inhomogeneity is severely drawn out in a direction which does not coincide with the direction of the magnetic field in the plasma. The ratio of the longitudinal and transverse dimensions of the inhomogeneity increases in proportion to the square root of t with the course of time. It is found that dispersion scattering substantially changes the character of the decrease of the concentration of particles in an inhomogeneity and completely determines its form. However, the authors point out that drift itself and the dispersion of the drift velocity in no way affects the amplitudes of the Fourier component of concentration disturbances. During diffusion the amplitudes decrease exponentially with time. Therefore, although dispersion of the drift velocity leads to scattering of the inhomogeneity and substantially affects the particle concentration and shape of the inhomogeneity, it does not change the scattering cross section of electromagnetic waves since the corss section depends only on the amplitudes of the components of the Fourier disturbances of electron density. The authors thank Yu. N. Zhivlyuk for performing the numerical calculations. Orig. art. has: 3 figures and 32 formulas.

SUB CODE: 20 / SUBM DATE: 24May65 / ORIG REF: 005

Card 2/2

L 45135-66 EWT(1)/FCC GW

ACC NR: AR6020058 SOURCE CODE: UR/0313/66/000/002/0041/0042

99

B

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

ORG: none

TITLE: The resonance disturbance of the ionosphere at the surface of the antenna situated on an artificial earth satellite

SOURCE: Ref. zh. Issl kosm prostr, Abs. 2.62.309

REF SOURCE: 15 Internats. kongress po astronavtike, Varshaya, sent., 1964

TOPIC TAGS: ionosphere, artificial satellite, antenna, electric current, Langmuir frequency, electron, plasma, hysteresis, electrode, current resonance

ABSTRACT: The author describes a method to study the ionosphere by measuring the constant component of the electric current flowing from the ionospheric plasma to an electrode to which a high-frequency electric potential has been applied. Such an electrode may be, for instance, an antenna placed on an artificial satellite.

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ACC NR: AR6020058

The author analyzes the problem of the resonance current increment, when the field frequency ω approaches the Langmuir frequency of the plasma resonance ω_0. This makes it possible to measure ω_0 and other parameters of the ionosphere. The problem is solved for the case when the field amplitude changes little over the distance which the electron traverses during the oscillation period. The mean disturbance of electron concentration in time in the environs of the antenna and the size of the field in plasma have been found. It is shown that at certain values of dielectric permeability, three values of the field inside the plasma correspond to each value of the field outside the plasma, e.g. a hysteresis takes place. Corrections related to nonlinearity, dissipation of energy, and space dispersion have been examined. The bibliography has nine titles. O. Givishvili.

[GC]

SUB CODE: 04, 09, 22/ SUBM DATE: none/

Card 2/2 ULR

L 06146-67 EWT(1)/FCC GW

ACC NR: AR6017542 SOURCE CODE: UR/0169/66/000/001/A010/A010

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

TITLE: On resonance perturbation of the ionosphere at the surface of an antenna placed on ISZ

SOURCE: Ref. zh. Geofizika, Abs. 1A49

REF SOURCE: (15 Internats. kongress po astronavtik. Varshava, sent., 1964.)- has not been published

TOPIC TAGS: ionosphere, ionospheric disturbance, ionospheric resonance, PLASMA PHYSICS

ABSTRACT: A method of ionospheric study is described using measurement of the constant component of current from the ionospheric plasma to an electrode with an HF electric potential. Such an electrode can be an antenna placed on ISZ. Resonance increase of the current, when field frequency ω is close to the Langmuir frequency of plasma resonance ω_0, is discussed. The problem is solved for field amplitudes changing little over the electron traverse distance of one oscillation period. The time average of the perturbation of the electron concentration at the antenna and the plasma field are found. It is shown that for some values of ε, to each magnitude of field outside the plasma correspond three magnitudes of the field inside the plasma, i.e., hysterisis takes place. Corrections due to non-linearity, energy dissipation and space dispersion are discussed. Translation of abstract .

SUB CODE: 04

UDC: 550.388.2

ACC NR: AP7006017 SOURCE CODE: UR/0203/66/006/005/0842/0851

AUTHOR: Gurevich, A. V.; Pitayevskiy, L. P.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR); Institute of Physical Problems, AN SSSR (Institut fizicheskikh problem AN SSSR)

TITLE: Radio wave scattering on the trail of a body moving in plasma

SOURCE: Geomagnetizm i aeronomiya, v. 6, no. 5, 1966, 842-851

TOPIC TAGS: radio wave scattering, ionosphere

ABSTRACT: In this study the authors present computations of the scattering of radio waves on perturbed electron concentrations behind a body moving in the lower ionosphere. The computations are generalized for the case when the body passes through the layer $\varepsilon = 0$. There also is a discussion of resonance scattering on the trail of a body moving along the magnetic field. The authors thank Ya. L. Al'pert for discussion of the results of the work. Orig. art. has: 2 figures, 32 formulas and 1 table. [JPRS: 38,937]

SUB CODE: 17 / SUBM DATE: 18Jun65 / ORIG REF: 012 / OTH REF: 002

Card 1/1 UDC: 550.37

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L 1543-66 EWT(1)/EWP(m)/FS(v)-3/ETC/EPF(n)-2/EWG(m)/EWA(d)/EPA(w)-2 IJP(c)
AT/GS/GW

ACCESSION NR: AT5023592 UR/0000/65/000/000/0241/0254

AUTHOR: Gurevich, A. V.; Moskalenko, A. M.

TITLE: Retardation of bodies moving in a rarefied plasma

SOURCE: Vsesoyuznaya konferentsiya po fizike kosmicheskogo prostranstva. Moscow, 1965. Issledovaniya kosmicheskogo prostranstva (Space research); trudy konferentsii. Moscow, Izd-vo Nauka, 1965, 241-254

TOPIC TAGS: satellite motion, spacecraft motion, plasma interaction, ion interaction

ABSTRACT: An investigation was made of the interaction of a moving body with neutral molecules and atoms, charged particles, and electric and magnetic fields in plasma. Precise solutions for the following problems were obtained: 1) Interaction of a body with neutral molecules and atoms. Two cases, involving high velocity of the body ($V_0^1>>1$) and low velocity ($V_0^1<<1$) were studied. 2) The retardation of a large fast-moving body whose radius is large in comparison with the Debye radius in the plasma (R>>D). 3) The retardation of a small body. 4) Interaction with bombarding ions and electrons. Retardation forces were obtained for two cases: when the velocity of the body is much higher than the thermal velocity of ions and when it

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ACCESSION NR: AT5023592

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is much lower, and 5) Interaction with reflected ions, in which several cases were investigated. The total forces of body retardation produced by bombarding ions, reflected ions (with neutralization), and ions scattered by a field were obtained. It is shown that when the velocity of the body is much lower than the thermal velocity of the ions, at small $e|\zeta_0|/kT$ the basic role in ion retardation of the body is played by those ions which collide with the body surface; at $e|\zeta_0|/kT \gtrsim 1$ the ions interacting with the electric field in the vicinity of the body are predominant. If the velocity of the body is much higher than the thermal velocity of the ions at small $e|\zeta_0|/\varepsilon_0$, the ions which collide with the body surface play the basic role. At $e|\zeta_0|/\varepsilon_0 > 1$, the primary role is played by the ions which interact with the electric field in the vicinity of the body. Orig. art. has: 67 formulas and 4 figures. [JA]

ASSOCIATION: none

SUBMITTED: 02Sep65 ENCL: 00 SUB CODE: ME, SV

NO REV SOV: 004 OTHER: 011 ATD PRESS: 4094

Card 2/2 SD

L 2735-66 EWT(l)/EEC/EPF(n)-2/EWG(m)/EPA(w)-2 IJP(c) AT
ACCESSION NR: AP5024337 UR/0367/65/002/002/0250/0256

44,55

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B

AUTHOR: Gurevich, A. V.; Silin, V. P. 44,55

TITLE: Radiation acceleration of a plasma 21,44,55

SOURCE: Yadernaya fizika, v. 2, no. 2, 1965, 250-256

TOPIC TAGS: plasma physics, plasma acceleration, plasma stability, plasma electromagnetic wave

ABSTRACT: The authors discuss some of the physical problems associated with the radiation mechanism of plasma acceleration. In contrast to theories already published, an attempt is made to explain processes associated with the fact that the accelerated materials is an ionized gas in which acceleration causes internal motions in addition to transposition of the entire mass. It is felt that these internal motions have a considerable effect on the dynamics of plasma acceleration. It is assumed that a plane electromagnetic wave with frequency ω is incident on a half-space completely filled with an ionized plasma. The authors limit themselves to the case of frequencies at which the plasma is opaque to radiation. In other words, the frequency of the external field ω is small in comparison with the Langmuir fre-

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ACCESSION NR: AP5024337

quency of the electrons $\omega_{Le} = (4\pi e^2 N / m)^{1/2}$.
The equations derived are applied to a restricted plasma. Consideration is given to deformation of the plasma layer as a result of thermal motion of ions and irregular motion of the field-plasma interface in an inhomogeneous plasma. Dissipative processes and problems of stability in the accelerated plasma are considered. It is found that heating of the plasma due to collisions has little effect on the proposed mechanism of acceleration, while instability due to interpenetrating plasmas, strong alternating electric fields and various other factors has a considerable effect on the possibilities of this acceleration mechanism. It is noted that acceleration efficiency may be improved as the average velocity of the plasma layer increases, since the fraction of the wave momentum lost to acceleration is proportional to V/c where V is the velocity of the boundary with respect to the plasma. However, this is a relativistic effect and therefore is beyond the scope of this paper. "The necessity for this last remark was seen after discussion of the work with Academician V. I. Veksler, to whom we are deeply grateful." Orig. art. has: 8 formulas.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITTED: 20Feb65 ENCL: 00 SUB CODE: ME

NO REF SOV: 010 OTHER: 001

Card 2/2

L 62110-65 EWT(d)/EWT(1)/EEC(k)-2/EWG(v)/FCC/EEC-4/EWA(h) Pn-4/Po-4/Pe-5/Pq-4/Pg-4/Pae-2/Pt-7/Peb/Pi-4/Pl-4 RB/GW/WS-4

ACCESSION NR: AP5005188 UR/0203/65/005/001/0070/0080

AUTHOR: Gurevich, A.V.

TITLE: The theory of nonlinear effects in radio wave propagation in the ionosphere

SOURCE: Geomagnetizm i aeronomiya, v. 5, no. 1, 1965, 70-80

TOPIC TAGS: upper atmosphere, radio wave propagation, ionosphere, nonlinear effect, plasma wave, radio wave absorption, beam focusing

ABSTRACT: Nonlinear phenomena developing during radio wave propagation in plasma are caused by the heating of electron gas in the variable field of the wave (thermal effect), the repulsion of plasma by the pressure of the nonhomogeneous electric field of the wave (striction effect) and possible nonlinear interaction and self-stress of radio waves caused by their scattering on particles or plasma waves. This paper is an investigation of the thermal effects; the author states that he knows of no earlier paper in which a nonhomogeneous electric field has been considered, despite the fact that an important role can be played by effects associated with such a field (since plasma is repulsed from a nonhomogeneously heated field). The author first analyzes a weakly ionized plasma in a nonhomogeneous, variable, electric field and then a strongly ionized plasma, completely or

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almost completely ionized, when the number of neutral particles is small and interaction among them can be neglected. It is shown that the determination of electron temperature and concentration in a completely ionized plasma in a variable electric field can be reduced to a single equation (whose derivation is given in detail). It also is demonstrated that nonlinear effects are stronger in a completely ionized plasma than in a weakly ionized plasma and are essentially dependent on the size of the plasma region heated by the field. Radio wave absorption in plasma with nonlinearity taken into account is also considered. With a change in electron concentration in a nonhomogeneous field there will be a displacement of the wave reflection point. In a nonhomogeneous field of a wave the distribution of the electron concentration in the plane (x, y) orthogonal to the direction of wave propagation also becomes nonhomogeneous. As a result, there can be autofocusing or autodefocusing of a nonhomogeneous beam propagating in plasma. A similar focusing or defocusing can occur for a wave reflected from the plasma layer; this can be of interest in radio communication based on the use of waves reflected from the ionosphere. "The author expresses appreciation to V. L. Ginzburg and L. V. Keldysh for useful discussions". Orig. art. has: 1 figure and 71 formulas.

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR (Physics Institute, AN SSSR)

Card 2/3

L 62110-65
ACCESSION NR: AP5005188

SUBMITTED: 25May64 ENCL: 00 SUB CODE: ES, EC

NO REF SOV: 006 OTHER: 002

Card 3/3

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

GUREVICH, A.V.; TSEDILINA, Ye.Ye.

Diffusive spreading of inhomogeneities in a weakly ionized plasma (ionosphere). Geomag. i aer. 5 no.2:251-259 Mr-Ap '65. (MIRA 18:7)

1. Fizicheskiy institut imeni Lebedeva AN SSSR i Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln AN SSSR.

GUREVICH, A.V.

Penetration of an electromagnetic wave into a plasma, taking nonlinearity into account. Zhur. eksp. i teor. fiz. 48 no.2: 701-707 F '65. (MIRA 18:11)

1. Fizicheskiy institut imeni P.N. Lebedeva AN SSSR.

GUREVICH, A.V.; ZHIVLYUK, Yu.N.

Runaway electrons in a nonequilibrium plasma. Zhur.eksp.i teor.fiz. 49 no.1:214-224 Jl '65. (MIRA 18:8)

1. Komissiya po spektroskopii AN SSSR.

GUREVICH, A.V.; PARIYSKAYA, L.V.; PITAYEVSKIY L.P.

Self-similar motion of a rarefied plasma. Zhur. eksp. i teor. fiz. 49 no.2:647-654 Ag '65. (MIRA 18:9)

1. Fizicheskiy institut imeni Lebedeva AN SSSR i Institut fizicheskikh problem AN SSSR.

GUREVICH, A.Ya., inzhenor.

Selection of objects for simplification and standardization. Standartizatsiia. no.5:21-23 S-O '56. (MIRA 10:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut stroydormash.
(Standardization) (Simplification in industry)

GUREVICH, A.Ya., inzhener.

On standardization of building and road machinery. Stroi.i dor. mashinostr. no.9:3-5 S.'56. (MLRA 9:11)
(Building mashinery) (Road machinery)

GUREVICH, A. Ya.

AUTHOR: Gurevich, A.Ya., Engineer, 28-4-4/35

TITLE: The Unification and Normalization of Construction and Road Building Machinery (Unifikatsiya i normalizatsiya stroitel'nykh i dorozhnykh mashin)

PERIODICAL: Standartizatsiya, 1957, # 4, pp 19-21 (USSR)

ABSTRACT: The present status of normalization of construction and road building machinery is reviewed.

By 1 January 1957, there were 424 branch norms (vedomstvennyye normali). Over the past two years 8 excavators and cranes, 22 construction machines, 10 road building machines and 16 machines for making building material were unified. Giprostroymash in cooperation with the Vyksa plant has unified roller conveyers, concrete distributors, traveling bridges, ball mills, jaw-crushers, runners, rollers, sorting sieves, conveyer-screw-band presses, chain pushers, band conveyers; the unification coefficient on the average amounts to 60% and in single cases to 86%. Nomenclature has been cut 67%.

VNIIStroydormash has worked out aggregate designs for vibration platforms for the making of standard reinforced concrete products, for concrete layers, turret cranes, and a unified series of auto-graders. With the use of unified components

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The Unification and Normalization of Construction and Road Building Machinery

like one-shaft and two-shaft vibrators, universal shafts, synchronizers, etc., 6 sizes of vibration platforms for the entire range of reinforced concrete work were composed (aggregated). The nomenclature of parts has been reduced from 767 to 315, of which 223 are unified. The new hydraulic drive components make it possible to assemble any needed hydraulic system. The series of 6 pumps, selected on the principle of the preference numbers system, and the diameter series of hydraulic cylinders (40 mm to 200 mm) for pressures up to 100 atm, should completely meet the needs of the road building and construction industry for some years. It is now possible to provide normalized components for whole groups of equipment such as internal combustion engines, electric power equipment, hydraulic drives, lubricators, band conveyers, etc.

This normalization gradually creates conditions for the devising of new machines by the aggregation method (putting together ready components).

About 40% of the items planned for normalization and unification are covered by norms (normali). The following documents are mentioned: "The Instruction for the Working Out of Norms", "The Classifier of Unified and Normalized Components and Parts" issued in 1956, the ГОСТ 8032-56 for the preference numbers system, the obligatory instruction for inspection of norms (1957), a new set of technical conditions (prepared in 1957) for technologic production processes of the subject machines.

The lack of a fixed criteria for determining the economic practicability of unification and normalization is pointed out. Evaluation solely by increase in production (quantity of identical work), still being practiced, is not grounded for all cases. When there is no fixed technological process, there is no data available for calculation, when there is such a fixed process, the calculation takes much time.

The essential tasks for the immediate future are specified as follows: A criterion of economic effectiveness, based on a method enabling quick calculation giving reliable factors must be established. Unification work should be concentrated mainly at the industrial plants, and only large items of intra-branch use should be left for research institutes. It is necessary to organize the designing of self-propelled chassis made of unified aggregates, and serving various equipment as loaders, excavators, scrapers, etc.; to develop projects for aggregate

28-4-4/35

The Unification and Normalization of Construction and Road Building Machinery

machines for the production of building materials; to make sets of drawings for use in further unification and normalization at the plants, SKB and institutes.

ASSOCIATION: VNIIStroydormash

AVAILABLE: Library of Congress

Card 4/4

GUREVICH, A. Ya., (Engr.)

"Experiment to Standardize and Normalize Construction and Road-building Machinery," Materials for the Second [Dec 1956] and Third [May 1957] Conferences on Standardization and Normalization in Machine Building, Moscow, Standartgiz, 1958.

25(2), 12(4) SOV/28-59-4-3/19

AUTHOR: Gurevich, A. Ya., Engineer

TITLE: Building Construction and Road-Building Machines From Standard Units (Agregatirovaniye stroitel'nykh i dorozhnykh mashin)

PERIODICAL: Standartizatsiya, 1959, Nr 4, pp 10-13 (USSR)

ABSTRACT: The idea of building machines from standard units, thus drastically cutting the designing and production cannot yet be fully applied to construction and road-building machinery, for there are as yet more than 600 branch standards ("otraslevyye normali") in force with too many different types and dimensions. Machines such as graders or loaders are being produced in small lots or even units, so that no commercial mass production can be organized. However, there are suitable units produced in the automobile and tractor industry. The author suggests that cooperation with these industries be established as soon as possible. The

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SOV/28-59-4-3/19

Building Construction and Road-Building Machines From Standard Units

automobile components must be "normalized" before, in order to prevent interruption of deliveries when the automobile plants switch over to new automobile models. One example of such a standard unit is illustrated: the chassis draft developed by the author's institute in 1957 (Figures 1, 2, 3) for different trailer machines. Only one complex component would be left, the gear box, to be designed anew for different machines. All other units except the frame and the minor parts could be composed of a tractor engine with its radiator, and of components of the automobiles "ZIL-150" and "ZIL-157". The Zavod dorozhnykh mashin (Road Machine Plant) in Osipenko, formerly producing the entire bucket loader "D-380", has now started using automobile axles for the loader "D-451". The Minskiy zavod "Udarnik" (Minsk Plant

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Building Construction and Road-Building Machines From Standard Units

"Udarnik") does the same for the multi-bucket loaders produced there. The Estonian "Ushosdor" for years has been using automobile components for the self-propelling graders it produces. There are 3 diagrams.

ASSOCIATION: VNIISTROYDORMASH

Card 3/3

NEMIROVSKIY, E.I., GUREVICH, A.Ya.

Standardization and use of interchangeable units in self-propelled chassis for building and road machinery. Standartizatsiia 24 no.7:15-20 Jl '60. (MIRA 13:7)
(Building machinery--Design and construction)
(Road machinery--Design and construction)

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

GUREVICH, A.Ya.

Classification of machinery. Standartizatsiia 25 no.11:7-12 N '61. (MIRA 14:11)

(Machinery—Classification)

BAGIROV, D.D., inzh.; GUREVICH, A.Ya., inzh.

"Internal-combustion engines of building and road machinery" by N.V.Pul'manov. Reviewed by D.D.Bagirov, A.IA.Gurevich. Stroi. i dor mash. 7 no.6:35 Je '62. (MIRA 15:7)
(Gas and oil engines) (Pul'manov, N.V.)

GUREVICH, A. Ya.

Dissertation defended for the degree of Doctor of Historical Sciences in the Institute of History

"Essays on the Social History of Norway During the IX-XII Centuries."

Vestnik Akad. Nauk, No. 4, 1963, pp 119-145

L 04254-67 EWT(m)/T DJ

ACC NR: AP6005378 (A) SOURCE CODE: UR/0413/66/000/001/0122/0122

28
B

AUTHORS: Volkov, V. N.; Gurevich, A. Ya.; Makeyev, M. A.; Studenikin, S. P.; Shchekotov, V. P.

ORG: none

TITLE: A radial-piston hydraulic engine. Class 47, No. 177726 [announced by All-Union Scientific Research Institute of Building and Road Construction Machinery (Vsesoyuznyy nauchno-issledovatel'skiy institut stroitel'nogo i dorozhnogo mashinostroyeniya)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 1, 1966, 122

TOPIC TAGS: bushing, shaft, hydraulic device, piston engine

ABSTRACT: This Author Certificate presents a radial-piston hydraulic engine containing a stator with a profiled inner surface, a rotor (in the radial hollows of which pistons are placed), a radially positioned journal distributor of the working fluid with two systems of longitudinal channels for delivery and removal of the working fluid, and a cover attached to the stator with channels for delivery and removal of the working fluid. To increase the operating reliability of the hydraulic engine by complete removal of lateral retarding forces from the distributor, the systems of longitudinal channels of the distributor are arranged symmetrically about its axis and are coupled, correspondingly, with an annular port and a diametral channel

Card 1/2 UDC: 621.225

L 04254-67

ACC NR: AP6005378

made in different planes in the shaft of the distributor. A bushing with two diametral channels (which coincide with the annular port and the diametral channel of the distributor) is mounted on the shaft of the distributor. The outer surface of this bushing has four bare spots perpendicular to the axis of each diametral channel. The channels of the cover for delivery and removal of the working fluid are diametrally coupled and coincide with the diametral channels of the bushing. In each channel of the cover is a fixed cup with a convex spherical end, clamped by a spring centered in this cup to a disk with a concave spherical end, which is clamped by the opposite flat end to the bare spot on the bushing.

SUB CODE: 13/ SUBM DATE: 01Jul63/

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Card 2/2

GUREVICH, A. Ye.

USSR/Electricity - Electric Drive
Rolling Mills

Oct 51

"Electric Drive for High-Speed Continuous Cold-Rolling Mills," Docent N. N. Druzhinin, Cand Tech Sci, A. Ye. Gurevich, Engr, TsNIITMASh

"Elektrichestvo" No 10, pp 40-47

Describes characteristics of the elec drive of high-speed continuous cold-rolling mills. Gives methods for detg the power of motors with consideration for the tension on the working strip and methods for selecting the proper type of drive. Submitted 2 Mar 51.

201T43

GUREVICH, A.Ye.; ROKOTYAN, Ye.S.

Power consumption in cold rolling of steel and nonferrous metals. Obr.met.davl. no.2:147-154 '53. (MIRA 12:10)

1. TSentral'noye konstruktorskoye byuro metallurgicheskogo mashinostroyeniya im TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii mashinostroyeniya.
(Rolling mills--Electric driving)
(Friction)

GUREVICH, A.YE.

KOROLEV, A.A., kandidat tekhnicheskikh nauk; KOGOS, A.M.; TOKARSKIY, A.P, NOSAL', V.V. GUREVICH, A.Ye., SHVARTSMAN, V.F.; KARPOV, V.F.; SHUL'MAN, P.G.; ADAMOVICH, N.K.; CHETYRBOK. F.M.; TSELIKOV, A.I., KUZ'MIN, A.D., kandidat tekhnicheskikh nauk; TIKHONOV, A.Ya., tekhnicheskiy redaktor.

[Blooming mill 1000] Bl!:ming 1000. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1955. 271 p. (MLRA 8:8)

1. Chlen-korrespondent AN SSSR (for TSelikov)
(Rolling mills)

GUREVICH, Azriyel' Yefimovich; ROKOTYAN, Yevgeniy Sergeyevich; AFANAS'YEV, V.D., redaktor; POBEDIN, I.S., redaktor; GORDON, L.M., redaktor izdatel'stva; BERLOV, A.P., tekhnicheskiy redaktor.

[Methods for investigating rolling mills] Metody issledovaniia prokatnykh stanov. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1957. 494 p. (MIRA 10:6)
(Rolling mills)

GUREVICH, A. Ye.

8(0) PHASE I BOOK EXPLOITATION SOV/3142

Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya

Spravochnyye dannyye po elektrooborudovaniyu (Reference Data on Electric Equipment) Moscow, Mashgiz, 1959. 711 p. (Series: Its: [Trudy] kniga 94)

Errata slip inserted. 6,000 copies printed.

Additional Sponsoring Agencies: USSR. Gosudarstvennaya planovaya komissiya, Glavnoye upravleniye nauchno-issledovatel'skikh i proyektnykh organizatsiy.

Compilers: A.Ye. Gurevich, Engineer, N.A. Vinogradov, Engineer, and B.V. D'yakov, Engineer; Ed.: A.Ye. Gurevich, Engineer; Tech. Ed.: Z.I. Chernova; Managing Ed. for Information Literature: I.M. Monastyrskiy, Engineer.

PURPOSE: The handbook is intended for use in design bureaus for rough drafts and technical designing. For operational designing

Card 1/10

PHASE I BOOK EXPLOITATION SOV/5451

Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya.

Spravochnyye dannyye po elektrooborudovaniyu (Reference Data on Electric Equipment) Moscow, Mashgiz, 1960. 607 p. (Series: Its: [Trudy] v. 95) Errata slip inserted. 13,500 copies printed.

Sponsoring Agency: Gosudarstvennyy komitet Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu and Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (TsNIITMASh).

Compilers: A. Ye. Gurevich, Engineer, and B. V. D'yakov, Engineer; Ed.: A. Ye. Gurevich, Engineer; Ed. of Publishing House: K. N. Ivanova; Tech. Ed.: A. Ya. Tikhanov; Managing Ed. for Information Literature: I. M. Monastyrskiy, Engineer.

PURPOSE: This handbook is intended for use in design offices for

Card 1/10

rough drafts and technical designing. For operational designing all handbook data should be checked with catalogs or comply with the manufacturer's specifications.

COVERAGE: The handbook contains technical data, overall dimensions, and characteristics of mercury-arc and crystal rectifiers, electric-drive control apparatus, and electric instruments. Furthermore, it contains information on the new single series d-c machinery which is being introduced in industry in place of general-purpose machinery of earlier manufacture. The handbook is a continuation of the TsNIITMASh volume 94, which appeared as SOV/3142. No personalities are mentioned. There are no references.

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SOV/5451

References Data (Cont.)

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References Data (Cont.)

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PART III. MEASURING INSTRUMENTS AND SUPPLEMENTARY INFORMATION ON ELECTRIC MACHINERY

APPROVED FOR RELEASE: 03/20/2001 CIA-RDP86-00513R000617410014-7"

References Data (Cont.) SOV/5451

AVAILABLE: Library of Congress

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Card 10/10

AFANAS'YEV, Vasiliy Danilovich; GUREVICH, A.Ye., red.; YEMZHIN, V.V., tekhn.red.

[Electric drives of automatically controlled flying shears] Elektroprivod avtomaticheskikh letuchikh nozhnits. Moskva, Gosenergoizdat, 1962. 143 p. (Biblioteka po avtomatike, no.59) (MIRA 15:10)

(Shears (Machine tools)--Electric driving)

BUR'YANOV, Viktor Fomin; ROKOTYAN, Yevgeniy Sergeyevich; GUREVICH, Azriel' Yefimovich; SON'KIN, M.A., red.; KISELEVA, T.I., ATTOPOVICH, M.K., tekhn. red.

[Calculating the power of main drive motors for rolling mills] Raschet moshchnosti dvigatelei glavnykh privodov prokatnykh stanov. Moskva, Metallurgizdat, 1962. 360 p. (MIRA 15:6)
(Rolling mills—Electric driving)

GUREVICH, A. YE.

PHASE I BOOK EXPLOITATION SOV/5985

Rokotyan, Ye. S., Doctor of Technical Sciences, ed.

Prokatnoye proizvodstvo; spravochnik (Rolling Industry; Handbook) v. 1. Moscow, Metallurgizdat, 1962. 743 p. Errata slip inserted. 9250 copies printed.

Authors of this volume: B. S. Azarenko, Candidate of Technical Sciences; V. D. Afanas'yev, Candidate of Technical Sciences; M. Ya. Brovman, Engineer; M. P. Vavilov, Engineer; A. B. Vernik, Engineer; K. A. Golubkov, Engineer; S. I. Gubkin, Academician, Academy of Sciences BSSR; A. Ye. Gurevich, Engineer; V. I. Davydov, Candidate of Technical Sciences; V. G. Drozd, Engineer; N. F. Yermolayev, Engineer; Ye. A. Zhukevich-Stosha, Engineer; N. M. Kirilin, Candidate of Technical Sciences; M. V. Kovynev, Engineer; A. M. Kogos, Engineer; A. A. Korolev, Professor; M. Ye. Kugayenko, Engineer; A. V. Laskin, Engineer; B. A. Levitanskiy, Engineer; V. M. Lugovskoy, Engineer; I. M. Meyerovich, Candidate of Technical Sciences; M. S. Ovcharov, Engineer; V. I. Pasternak, Engineer; I. L. Perlin, Doctor of Technical Sciences; I. S. Pobedin, Candidate of Technical Sciences; Ye. S. Rokotyan, Doctor of Technical Sciences; M. M. Saf'yan, Candidate of Technical Sciences; V. V. Smirnov, Candidate of Technical Sciences; V. S. Smirnov, Corresponding Member, Academy of Sciences USSR; O. P. Sokolovskiy,

Card 1/19

Engineer; O. P. Solov'yev, Engineer; M. A. Sidorkevich, Engineer; Ye. M. Tret'yakov, Engineer; I. S. Trishevskiy, Candidate of Technical Sciences; G. N. Khenkin, Engineer; and A. I. Tselikov, Corresponding Member, Academy of Sciences USSR. Introduction: A. I. Tselikov, Corresponding Member, Academy of Sciences USSR; Ye. S. Rokotyan, Doctor of Technical Sciences; and L. S. Al'shevskiy, Candidate of Technical Sciences.

Eds. of Publishing House: V. M. Gorobinchenko, R. M. Golubchik, and V. A. Rymov; Tech. Ed.: L. V. Dobuzhinskaya.

PURPOSE: This handbook is intended for technical personnel of metallurgical and machine-building plants, scientific research institutes, and planning and design organizations. It may also be useful to students at schools of higher education.

COVERAGE: The fundamentals of plastic deformation of metals are discussed along with the theory of rolling and drawing. Methods of determining the power consumption and the forces in rolling with plane surface or grooved rolls are reviewed. Articles dealing with the classification of rolling mills, general problems of design of rolling-mill stands, lubrication equipment, and the erection of rolling mills are included. The equipment of various types of rolling mills is described, and basic principles of the electric drive and automation of rolling mills are explained. No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress

SUBJECT: Metals and Metallurgy

Card 19/19

DV/wrc/gmp
8-2-62

AFANAS'YEV, Vasiliy Danilovich; BORISOV, Yuriy Matveyevich; GUREVICH, Azrivel' Yefimovich; LEVITANSKIY, Boris Aronovich; MAKEYEV, Ivan Fedorovich; STEFANOVICH, Nikolay Nikolayevich; KHALIZEV, Georgiy Petrovich, kand. tekhn. nauk; SINITSYN, O.A., kand. tekhn. nauk, retsenzent; NEMIROVSKIY, M.I., prepodavatel', retsenzent; YAKOVENKO, N.N., red. izd-va; ISLENT'YEVA, P.G., tekhn. red.

[Electrical equipment of ferrous metallurgy enterprises] Elektro-oborudovanie predpriiatii chernoi metallurgii. [By] V.D.Afanas'yev i dr. Moskva, Metallurgizdat, 1963. 606 p. (MIRA 16:9)

1. Dnepropetrovskiy metallurgicheskiy tekhnikum (for Nemirovskiy). (Iron and steel plants--Electric equipment)

GUREVICH, A.Ye., red.; D'YAKOV, B.V., red.

[Reference data on electrical equipment] Spravochnye dannye po elektrooborudovaniiu. Moskva, Energiia. Vol.1. 1964. 326 p. (MIRA 18:1)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut metallurgicheskogo mashinostroyeniya.

GUREVICH, A.Ye.; D'YAKOV, B.V.

[Reference data on electrical equipment] Spravochnye dannye po elektrooborudovaniiu. Moskva, Energiia. Vol.2. 1965. 482 p. (MIRA 18:7)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut metallurgicheskogo mashinostroyeniya.

ACC NR: AP7004811 SOURCE CODE: UR/0413/67/000/001/0169/0169

INVENTOR: Tselikov, A.M.; Shor, E.R.; Rokotyan, Ye.S.; Kruglikov, A.V.; Gurevich, A.Ye.

ORG: none

TITLE: Two or four-high mill for rolling variable-section sheets and strips. Class 7, No. 87892

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no.1, 1967, 169

TOPIC TAGS: metal rolling, ~~light alloy rolling, metal~~ rolling mill

ABSTRACT: This Author Certificate introduces a two or four-high mill for rolling one or two-way wedge-shaped sheets and strips from steel and light alloys by means of changing the working rolls' spacing. To increase rolling mill efficiency, a powerful automatic pressure device is used which ensures a constant relation between the rotation speed of the screw-down drives and the working rolls. [AZ]

SUB CODE: 13/ SUBM DATE: 11Mar49/ ATD PRESS: 5116

Card 1/1 UDC: none

KARPOV, I.; GUREVICH, B.

New developments in the construction of blast furnaces in 1962. Prom. stroi. i inzh. soor. 4 no.3:31-35 My-Je '62. (MIRA 15:7)

1. Nachal'nik tekhnicheskogo otdela Ukrglavstal'konstruktsii (for Karpov). 2. Glavnyy konstruktor Dnepropetrovskogo otdela Ukrproyektstal'konstruktsii (for Gurevich).
(Blast furnaces)

GUREVICH, B.A., kandidat meditsinskikh nauk.

Fistulography of open forms of osteoarticular tuberculosis. Probl.tub. no.5:73 S-O '53. (MLRA 6:12)

1. Iz Moskovskogo oblastnogo nauchno-issledovatel'skogo tuberkuleznogo instituta (direktor - professor F.V.Shebanov, zaveduyushchiy kostno-khirurgicheskim otdeleniyem - dotsent K.Ye.Pokotilov).
(Joints--Tuberculosis) (Bones--Tuberculosis)